

REMARKS

In response to the Office Action mailed August 27, 2004, Applicants respectfully request reconsideration of the Application in view of the foregoing Amendments and the following Remarks. The claims as now presented are believed to be in allowable condition.

Claims 2 and 16 have been canceled, and claims 1, 3, 5, 6, 7, 12, 14, 15, 17, 20, and 21 have been amended. Claims 1, 3-15, and 17-25 remain in this application, of which claims 1, 12, and 15 are independent claims. Claim 26 has been newly added to depend from claim 1, and claim 27 has been newly added to depend from claim 15.

Claim Objection

Claim 3, line 6 is objected to because “force” lacks proper antecedent basis. Claim 3, line 6 has been amended to no longer recite the “force”.

Rejection of Claims 1, 3-4, 7-8, 10-15, 17-18, 21-22, and 24-25 under 35 U.S.C. §102(b)

Claims 1, 3-4, 7-8, 10-15, 17-18, 21-22, and 24-25 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,766,021 to Pickles et al. (hereafter referred to as “Pickles”). Applicants respectfully traverse this rejection.

The Examiner states that the term “a lateral direction of force” is too broadly recited and does not define which direction is a side direction. Applicants respectfully thank the Examiner for her suggestion to more clearly define and recite the term “a lateral direction of force” in the claims.

Claims 1, 12, and 15 have been amended to delete the recitation of “lateral direction of force”. Claims 3 and 17 have been amended to recite that the lateral direction of the force applied on the pin is always perpendicular to a length of the pin. Such a lateral direction of force

is described and illustrated by the arrow under the actuation plate 216 in Figs. 6 and 7 of the Present Application.

In addition, the rejection of claims 1, 12, and 15 under 35 U.S.C. §102(b) as being anticipated by Pickles is not appropriate because claims 1, 12, and 15 have been amended to recite a compression mount lead including a compression mechanism that compresses the compression mount lead against the contact pad of the circuit board with a compressive force.

Thus, claims 1, 12, and 15 now recite a socket and a method of its use with the *novel combination* of a zif opening and a compression mount lead with a compression mechanism that compresses the compression mount lead against the contact pad of the circuit board with a compressive force.

The Examiner cites elements 114 of Fig. 8, 202 of Fig. 11, and 314 of Fig. 12 in Pickles as such a compression mount lead. However, Pickles specifically states that the lead 114 is insertion fitted into the circuit board 102 as stated at col. 4, lines 39-61 of Pickles:

In another embodiment shown in Figs. 7-8, a socket assembly 100 for receiving a BGA package and adapted for *insertion* into the circuit board 102 includes a plurality of spaced sockets 104 fixed in a base member 106, and a substantially rigid member 108 for reshaping the sockets. Each of the plurality of sockets 104 include a receiving portion 110 having a plurality of spaced fingers 112 and a pin portion 114, a part of which extends through the base member 106 for *insertion* into the circuit board 102.... (Emphasis added.)

When the socket lead 114 is insertion fitted into the circuit board 102, the socket leads 114 are typically soldered or wire-wrapped for making electrical contact within the circuit board. Thus, the socket leads 114 are illustrated in Pickles just as plain pin leads.

In fact referring to Figs. 7 and 8 of Pickles, the leads 114 are just plain leads without any type of compression mechanism for compressing the leads 114 against contacts of the circuit board 102 with a compressive force. In fact, Pickles no where even remotely suggests such a

compression mount lead having a compression mechanism for compressing the leads 114 against contacts of the circuit board 102 with a compressive force.

Anticipation of a claimed invention requires the presence in a single prior art document of *each and every* element of the properly construed claim. The Federal Circuit has set out the following requirements for anticipation pursuant to 35 U.S.C. §102:

...that a patent claim is anticipated under 35 U.S.C. §102 “must demonstrate, among other things, identity of invention.”...[O]ne who seeks such a finding must show that each element of the claim in issue is found, either expressly or under principles of inherency, in a single prior art reference, or that the claimed invention was previously known or embodied in a single prior art device or practice.

Minnesota Mining & Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc., 976 F.2d 1559, 1565 (Fed. Cir. 1992).

Because Pickles does not disclose, teach, or suggest all of the limitations of amended claims 1, 12, and 15, the rejection of claims 1, 12, and 15 under 35 U.S.C. §102(b) in view of Pickles should be withdrawn.

Claims 2 and 16 have been canceled.

Claims 3, 4, 7-8, 10, and 11, which depend from and further limit claim 1, are allowable for at least the same reasons that claim 1 is allowable as stated above.

Claims 13 and 14, which depend from and further limit claim 12, are allowable for at least the same reasons that claim 12 is allowable as stated above.

Claims 17, 18, 21-22, and 24-25, which depend from and further limit claim 15, are allowable for at least the same reasons that claim 15 is allowable as stated above.

Rejection of Claims 5 and 19 under 35 U.S.C. §103(a)

Claims 5 and 19 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,766,021 to Pickles et al. (hereafter referred to as “Pickles”) in view of Applicants’ Admitted Prior Art (hereafter referred to as “AAPA”). Applicants respectfully traverse this rejection.

Claim 5, which depends from and further limits claim 1, is allowable for at least the same reasons that claim 1 is allowable as stated above.

Claim 19, which depends from and further limits claim 15, is allowable for at least the same reasons that claim 15 is allowable as stated above.

In addition, such a rejection of claims 5 and 19 under 35 U.S.C. §103(a) is inappropriate because a prima facie case of obviousness cannot be established.

In giving an obviousness rejection, the Examiner bears the initial burden of factually supporting a prima facie conclusion of obviousness. (See, MPEP, §2142). To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be *some suggestion or motivation*, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art references must teach or suggest all the claim limitations. (See, MPEP, §2142.) (Emphasis added.)

The AAPA just shows the pogo spring mechanism without any zif opening, and there is no suggestion or motivation in the AAPA to modify the AAPA to the present invention. The dual ended pogo spring of the AAPA is a more simple socket system with just the pogo springs being used for making connections to both the pins of the IC device and the contact pads of the circuit board.

Modification to the present invention of claims 5 and 19 from the AAPA requires costly change to the top of the socket to include zif openings with the additional mechanism for connecting to the pins of the IC device. In addition, such costly modification may be for hundreds of pins in the modern IC device. The AAPA would not suggest or motivate such a

costly modification, and in fact, the high cost and complexity for so many pins in the modern IC device would *deter* such a modification.

In addition, Pickles nowhere even remotely suggests or motivates using a compression mount lead. Pickles just states that the lead 114 is insertion fitted or surface mounted into the circuit board 102 as stated at col. 4, lines 39-61 of Pickles:

In another embodiment shown in Figs. 7-8, a socket assembly 100 for receiving a BGA package and adapted for *insertion* into the circuit board 102 includes a plurality of spaced sockets 104 fixed in a base member 106, and a substantially rigid member 108 for reshaping the sockets. Each of the plurality of sockets 104 include a receiving portion 110 having a plurality of spaced fingers 112 and a pin portion 114, a part of which extends through the base member 106 for *insertion* into the circuit board 102....It is understood that in other embodiments, the socket assembly fits into other configurations such as *surface mount*, or other package footprints known in the art. (Emphasis added.)

Such insertion fitting, surface mount, or footprint technology typically involves soldering (or wire-wrapping) the leads to the circuit board. Modification to the present invention of claims 5 and 19 from Pickles requires costly modification of each of the bottom leads 114 of the socket to include a pogo spring mechanism and to include a mechanism for attaching the socket to the circuit board. In addition, such modification may be required for hundreds of leads 114 of the socket in Pickles for the modern IC device. Pickles would not suggest or motivate such a costly modification, and in fact, and the high cost and complexity for so many pins in the modern IC device would *deter* such a modification.

Thus, the Examiner is respectfully requested to point out the specific column and line numbers in the AAPA and/or Pickles that would suggest or motivate such costly and complex modifications.

Rejection of Claims 6 and 20 under 35 U.S.C. §103(a)

Claims 6 and 20 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,766,021 to Pickles et al. (hereafter referred to as "Pickles") in view of U.S. Patent

No. 6,558,182 to Ohkita et al. (hereafter referred to as “Ohkita”). Applicants respectfully traverse this rejection.

The rejection of claims 6 and 20 under 35 U.S.C. §103(a) as being unpatentable over Pickles in view of Ohkita is not appropriate because a prima facie case of obviousness cannot be established.

In giving an obviousness rejection, the Examiner bears the initial burden of factually supporting a prima facie conclusion of obviousness. (See, MPEP, §2142). To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be *some suggestion or motivation*, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, *the prior art references* must teach or suggest *all the claim limitations*. (See, MPEP, §2142.) (Emphasis added.)

The rejection of claims 6 and 20 under 35 U.S.C. §103(a) as being unpatentable over Pickles in view of Ohkita is not appropriate because *inter alia* these prior art references fail to teach or suggest all the claim limitations and because there is no motivation or suggestion in these references to combine or modify these references to the present invention.

Claims 6 and 20 have been amended to recite that the compression mount lead is comprised of a *J-bend lead that is compressed against* the contact pad of the circuit board. The examiner cites the tail 108 of Ohkita for such a J-bend lead.

Applicants respectfully disagree with such a mis-characterization of the tail 108 of Ohkita. The tail 108 of Ohkita is *repeatedly* described as a solder pad 108 that is soldered to the circuit board such as at the Abstract, lines 8-10 of Ohkita:

....Each terminal includes a base section retained in each cell and a tail extending beyond the housing for being **soldered** to the circuit board.... (Emphasis added.)

In addition, col. 1, lines 39-43 of Ohkita states:

...Terminals of both types have a base section received and securely retained in the cell of the housing and a tail extending from the base and beyond a lower face of the housing for being **soldered** to the circuit board...(Emphasis added.)

Furthermore, col. 2, lines 44-48 of Ohkita states:

....Each dual-beam terminal comprises a base section received and firmly retained in the corresponding cell and a tail extending from the base section and beyond the housing for being **soldered** to the circuit board....(Emphasis added.)

Additionally, col. 3, lines 34-42 of Ohkita states:

....A tail section 106 extends from a lower edge of the base section 102. The tail section 106 comprises a **solder** pad 108 connected to the lower edge of the base section 102 by a neck portion 109. The neck portion 109 is bent an angle of approximately **90 degrees** whereby a second major surface of the **solder** pad 108 is substantially normal to the first major surface of the base section 102.

The **solder** pad 106 can carry a **solder** ball (not shown) for connecting the terminal 100 to a circuit board (not shown) by Surface Mount Technology (SMT)....(Emphasis added.)

Thus, Ohkita **repeatedly** discloses an **L-shaped** (angled 90 degrees) tail section 106 with a **solder** pad 108 for being **soldered** to the circuit pad. With such soldering, the solder pad 108 is solder-connected to the circuit board and is not compressed against the circuit board in Ohkita. Thus, the tail section with the solder pad 108 of Ohkita cannot be fairly characterized as a J-bend that is **compressed** against the contact pad of the circuit board

In addition, by repeatedly touting the advantage of the solder pad 108 being soldered to the circuit board, Ohkita teaches away from using a compressed J-bend lead which is **completely different** from the soldered lead 106 of Ohkita. The solder lead 106 of Ohkita is permanently attached to the circuit board, whereas a J-bend lead of the present invention is temporarily attached to the circuit board and is easily detachable from the circuit board.

Accordingly, a prima facie conclusion of obviousness of claims 6 and 20 cannot be established because Pickles and Ohkita fail to suggest or motivate all the claim limitations of claims 6 and 20, and the rejection of claims 6 and 20 under 35 U.S.C. §103(a) should be withdrawn.

Rejection of Claims 9 and 23 under 35 U.S.C. §103(a)

Claims 9 and 23 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,766,021 to Pickles et al. (hereafter referred to as “Pickles”). Applicants respectfully traverse this rejection.

The rejection of claims 9 and 23 under 35 U.S.C. §103(a) as being unpatentable over Pickles is not appropriate because a prima facie case of obviousness cannot be established.

In giving an obviousness rejection, the Examiner bears the initial burden of factually supporting a prima facie conclusion of obviousness. (See, MPEP, §2142). To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be *some suggestion or motivation*, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, *the prior art references* must teach or suggest *all the claim limitations*. (See, MPEP, §2142.) (Emphasis added.)

The rejection of claims 9 and 23 under 35 U.S.C. §103(a) as being unpatentable over Pickles is not appropriate because *inter alia* Pickles fails to teach or suggest all the claim limitations and because there is no motivation or suggestion in Pickles to be modified to the present invention.

Claims 9 and 23 recite a back plate mounted to a back-side of the circuit board when the socket is mounted to a front-side of the circuit board.

The back plate provides added support for preventing warping of the circuit board and the socket when the socket is compression mounted to the circuit board. However, Pickles nowhere even remotely mentions compression mounting of the socket to the circuit board. Pickles merely discloses through-hole insertion of the socket leads into the circuit board (as illustrated in Fig. 8 of Pickles) or surface mount foot-print technology which typically includes soldering the socket leads to the circuit board, as stated at col. 4, lines 39-61 of Pickles:

In another embodiment shown in Figs. 7-8, a socket assembly 100 for receiving a BGA package and adapted for *insertion* into the circuit board 102 includes a plurality of spaced sockets 104 fixed in a base member 106, and a substantially rigid member 108 for reshaping the sockets. Each of the plurality of sockets 104 include a receiving portion 110 having a plurality of spaced fingers 112 and a pin portion 114, a part of which extends through the base member 106 for *insertion* into the circuit board 102....It is understood that in other embodiments, the socket assembly fits into other configurations such as *surface mount*, or other package footprints known in the art. (Emphasis added.)

Thus, without compression mounting of the socket leads to the circuit board, one of ordinary skill in the art would not be motivated to spend the *extra cost and time* of adding the extra back-plate to the back-side of the circuit board.

In addition, the Examiner is respectfully directed to the MPEP at §2143 which states that the fact that the claimed invention is within the capabilities of one of ordinary skill in the art is not sufficient *by itself* to establish prima facie obviousness, and that the mere fact that references *can be* combined or modified does not render the resultant combination or modification obvious *unless the prior art also suggests the desirability of the combination or modification*.

If the Examiner disagrees that Pickles fails to suggest or motivate all the limitations of claims 9 and 23, the Examiner is respectfully requested to point out *exactly where*, including *specific column(s), line number(s), and/or figure element(s)* in Pickles such a suggestion or motivation may be found. In particular, Pickles is not at all concerned with warping of the

circuit board and socket since compression mount of the socket to the circuit board is not mentioned. Rather, insertion mounting and soldering of the socket leads to the circuit board are disclosed which would not result in warping of the circuit board and socket.

The Examiner merely states “it would have been obvious to one having ordinary skill at the time the invention was made to add on the socket system of Pickles an extra plate mounted to the back-side of the circuit board....”

However, the Examiner is respectfully reminded that for establishing an obviousness rejection under 35 U.S.C. §103(a), the standard is not whether it would have been “obvious to one having ordinary skill in the art”. Rather, the MPEP clearly states that *the prior art references* must teach or suggest all the claim limitations.

Accordingly, a prima facie conclusion of obviousness of claims 9 and 23 cannot be established because Pickles fails to suggest or motivate all the claim limitations of claims 9 and 23, and the rejection of claims 9 and 23 under 35 U.S.C. §103(a) should be withdrawn.

Newly Added Claims

Newly added claim 26, which depends from and further limits claim 1, is allowable for at least the same reasons that claim 1 is allowable as stated above.

Newly added claim 27, which depends from and further limits claim 15, is allowable for at least the same reasons that claim 15 is allowable as stated above.

Information Disclosure Statement

U.S. Patent Application No. 2003/0032320 to Abe et al. (hereafter referred to as “Abe”) and U.S. Patent No. 6,242,933 to Yap (hereafter referred to as “Yap”) were recently received as cited in a corresponding PCT application. Abe and Yap are hereby submitted with the RCE in an Information Disclosure Statement.

Applicants believe claims 1, 3-15, and 17-27 are patentable over Abe and Yap.

Referring to Figs. 7A, 7B, and 7C of Abe, the socket of Abe just has plain leads 36B without any compression mount lead including a compression mechanism. The plain leads of 36B of Abe are contemplated to be soldered or wire-wrapped to the circuit board. In addition, Abe nowhere even remotely suggests or motivates modification of the plain leads 36B to include such a compression mechanism. Fig. 2 of Abe shows a top view of the socket having hundreds of such leads. Such modification for each of the hundreds of leads would be highly complex and costly, and Abe does not suggest or motivate such a modification.

Yap is directed to a device **probe** socket for readily making contact to a plurality of IC devices mounted to a strip. Referring to Fig. 3b of Yap, first and second pogo springs 32 and 42 are used at both ends to interface to the IC device and to the circuit board. Referring to Fig. 4 of Yap, a plurality of IC devices are mounted to the strip 52. Then, first pogo springs 32 are used to contact nodes of the IC devices on the strip 52, and second pogo springs 42 are used to interface to the test system.

Because Yap is directed to just being able to move around the plurality of IC devices on the strip 52 with the first pogo springs 32, Yap **teaches away** from combining the second pogo springs 42 at the circuit board interface with a zif opening for holding pins of an individual IC device. In fact, as stated at col. 1, lines 18-22, Yap contemplates the BGA contact balls of the IC device to just be **soldered** to the circuit board:

A Ball Grid Array (BGA) is an array of **solderable** balls placed on a chip carrier. The balls contact a printed circuit board in an array configuration where, **after reheat**, the balls connect the chip to the printed **circuit board**....(Emphasis added.)

In addition, Yap touts being able to test strips of a plurality of IC devices at a time instead of an individual IC device at a time at col. 1, lines 45-65:

....While high speed testing has been current practice in the industry for a number of years, this testing in most cases handles *individual chips*. By mounting individual chips *onto strips* the flow of chips through the manufacturing and testing cycles can be greatly facilitated. This improved capability of handling a larger number of chips has to be accompanied with corresponding improvements in the testing capabilities for these chips. Moreover, strip testing also eliminates the use of trays for transportation and storage of individual chips throughout the whole testing process. This results in requirements for improved capabilities of handling chips that are mounted on strips in the testing environment. These improved capabilities transport chips at a *rapid rate* in and out of the test position. While in the test position, the chips must be *contacted in a rapid* and dependable way so that the chip can be tested. This contacting of the chip while the chip is in the position where it can be tested is done by means of probe sockets. The invention addresses a probe socket design that meets the requirements of *rapidly* and dependably contacting semiconductor devices for purpose of testing these devices. (Emphasis added.)

Thus, referring to Fig. 4 of Yap, for making rapid contact to the multiple IC devices during strip testing, using the first pogo springs 32 for probing the nodes of the IC device interchangeably among the multiple IC devices on the strip 52 is critical. Because Yap touts the advantage of such strip testing, Yap *teaches away* from combining the second pogo springs 42 with a zif opening with manual adjustment for holding pins of an individual IC device. Rather in Yap, both pogo springs 32 and 42 at both ends of the IC device and the testing system are critical for rapid strip testing of the multiple IC devices on the strip.

The Examiner is respectfully reminded of §2141.02 of the MPEP which states that the “prior art must be considered in its entirety, including disclosures that each away from the claims.”

In summary, Yap and Abe do not even remotely suggest or motivate the novel combination of a zif opening for contact to the IC device and a compression mount lead with a compression mechanism for contact to the circuit board. Rather, Yap even teaches away from such a combination by touting the advantages of rapid strip testing whereby using the dual ended pogo spring mechanism at both ends of the IC device and the testing system is critical.

Conclusions

In view of the foregoing amendments and remarks, this application should now be in condition for allowance. A notice to this effect is respectfully requested. Please feel free to contact the undersigned should any questions arise with respect to this case that may be addressed by telephone.

Respectfully submitted,
for the Applicant(s)

Dated: December 20, 2004

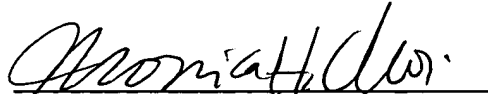
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CERTIFICATE OF MAILING

The undersigned hereby certifies that the foregoing AMENDMENT AND RESPONSE as a submission in the enclosed RCE is being deposited in the United States Postal Service, as first class mail, postage prepaid, in an envelope addressed to Commissioner for Patents, Box AF, P.O. Box 1450, Alexandria, VA 22313-1450, on this 20th day of December, 2004.



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